MIDTERM REVIEW TOPICS NAME: _____

Chapters 1 and 2:

- Distinguish between physical and chemical properties
- Distinguish between physical and chemical changes
- Distinguish between qualitative and quantitative
- Explain the difference between mass and weight
- Classify matter
  - Element
  - Compound
  - Pure substance
  - Homogeneous mixture
  - Heterogeneous mixture
- Describe specific processes
  - Distillation
  - Filtration
  - Crystallization
  - Chromatography
- Determine the number of atoms in a formula
- Explain the scientific method and know the steps
- Distinguish between independent and dependent variables
- Distinguish between
  - Law
  - Theory
  - Hypothesis
  - Observation
- Explain endothermic and exothermic
- Demonstrate knowledge of the Law of Conservation of Mass

Chapter 3:

- Density
  - Calculate density, volume, and mass
  - Determine the density of a substance using the slope of a line
- Conversions
  - Metric system
  - SI system of Units
  - Factor labeling
- Significant figures
  - Determine sig figs
  - Round sig figs
  - Add, subtract, multiply, and divide using sig figs
- Scientific notation
  - Write numbers in scientific notation
  - Add, subtract, multiply, and divide using scientific notation

Chapters 4 and 25:

- Know the contributions made by each scientist in the development of atomic structure and be able to describe experiments associated with these scientists:
  - Democritus
  - Dalton
  - Thomson (cathode ray experiment and the discovery of the electron)
  - Rutherford (gold foil experiment and the discovery of the nucleus)
  - Chadwick (discovery of the neutron)

- Describe the structure of the atom
    - Protons
    - Neutrons
    - Electrons

- Be able to calculate atomic mass

-Be able to calculate mass number and distinguish it from atomic mass
- Isotopes
    - Description
    - Isotope notation
    - Nuclear notation
- Radioactivity
    - Calculate half-life
    - Explain the band of stability and be able to predict the type of decay that would occur for any given radioactive isotope
    - Describe the types of radiation
    - Write the equations of the five types of radioactive decay
        - Alpha
        - Beta
        - Gamma
        - Positron emission
        - Electron capture

Chapter 5:
- Electromagnetic spectrum
    - Description
    - Calculate frequency, energy, and wavelength of an electromagnetic wave
- Valence electrons
    - Definition
    - Significance
    - Determine the number of valence electrons of an element
    - Draw the electron-dot structure of an element
- Electron configuration
    - Write the electron configuration of an element
    - Write the orbital diagram of an element
    - Write the noble gas configuration of an element

Chapter 6:
- Periodic table
    - Determine if an element is a metal, nonmetal, or metalloid
    - Know the properties of metals, nonmetals, and metalloids
    - Explain the history and trends of the periodic table
    - Describe elements in terms of group, period, block, and family name
    - Know the properties of the families of the periodic table
- Understand the concept of periodic law
- Determine if an element will form an anion (negatively charged ion) or a cation (positively charged ion)
- Determine the charge of the most commonly formed ion

Chapter 7 & 8:
-Explain the formation of ionic bonds and covalent bond
-Describe metallic bonding
-Define Alloys and their characteristic properties
-Describe the physical properties of ionic and covalent compounds
-Determine if a molecule exhibits resonance
-Know the exceptions to the octet rule
-Differentiate sigma bonds from pi bonds
-Be able to drawn a molecule
-Determine the VSEPR shape of a molecule
-Determine bond and molecular polarity